

Effect of Organic Fertilizers on the Improvement of Soil Microbiological Functioning under Saline Conditions of Arid Regions: Impact on Carbon and Nitrogen Mineralization

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Abstract : This study was conducted on representative and contrasting soils of arid regions. It focuses on the compared influence of two organic fertilizers: poultry manure (PM) and bovine manure (BM) on improving the microbial functioning of non-saline (SS) and saline (SSS) soils, in particularly, the process of mineralization of nitrogen and carbon. The microbiological activity was estimated by respirometric test (CO₂-C emissions) and the extraction of two forms of mineral nitrogen (NH₄⁺-N and NO₃⁻-N). Thus, after 56 days of incubation under controlled conditions (28 degrees and 80 per cent of the field capacity), the two types of manures showed that the mineralization activity varies according to type of soil and the organic substrate itself. However, the highest cumulative quantities of CO₂-C, NH₄⁺-N and NO₃⁻-N obtained at the end of incubation were recorded in non-saline (SS) soil treated with poultry manure with 1173.4, 4.26 and 8.40 mg/100 g of dry soil, respectively. The reductions in rates of release of CO₂-C and of nitrification under saline conditions were 21 and 36, 78 %, respectively. The influence of organic substratum on the microbial density shows a stimulating effect on all microbial groups studied. The whole results show the usefulness of two types of manures for the improvement of the microbiological functioning of arid soils.

Keywords : Salinity, Organic matter, Microorganisms, Mineralization, Nitrogen, Carbon, Arid regions

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